Case Study:

Boulder Labs Mentoring Pilot: Accelerating Knowledge Transfer

By Dr. David DeLong

In mid-January 2006, Sara Millar stared out the window of her second floor office at the Boulder R&D Center[1]. She wondered how she was going to improve the productivity of the Chemical Innovations Team (CIT) that she had taken over in the last week. Funded by the U.S. Department of Energy, the Center does research and product development on a broad range of environmental and energy-related technologies. Millar's 10-member team was responsible for developing new technologies that could be used to clean up toxic waste sites. But, in her first management job, Millar faced a number of daunting challenges.

She knew that the organization, known locally as the Boulder Labs, was at risk of losing unique knowledge about chemical technologies if she didn't help older employees share their expertise before retiring. In addition, she had young employees just out of college who needed extensive training in the unusual aspects of the Lab's work before they could become productive. She also recognized that unless these new, inexperienced employees quickly became engaged with interesting work they were more likely to leave. In addition, Millar wanted to recapture some important capabilities that her group had lost in recent years. For example, the organization's inability to staff and run its Toxic Substance Testing (TST) Lab meant the unit couldn't bid for important outside contracts and had to outsource their own testing to more expensive vendors.

Millar had already known that if she didn't find a way to greatly improve her team's knowledge transfer practices the unit was in danger of losing even more critical capabilities. Months earlier, she had volunteered to take the lead in exploring new approaches to mentoring. Millar started by taking a workshop called "Peer Mentoring: a Practical Approach to Knowledge Transfer" in September 2005. Millar had returned to the Lab enthusiastic about the program and tried to convince her boss that the training should be applied throughout their division. Fast forward to January, when Millar assumed her role as leader of the Chemical Innovations Team, she quickly volunteered her group to pilot the knowledge transfer program and get the ball rolling.

About 60 employees at Boulder, along with members of Millar's team, took the "Peer Mentoring" workshop during the early part of 2006. This included both experienced and new employees because both would be able to use the tools. Millar attended the workshop again with her team to reinforce the importance she placed on using these new knowledge transfer techniques. In the full day session, participants learned how to:

- Define their roles and responsibilities as mentors, apprentices, or managers
- Clarify the best ways to communicate with each other during the busy work day
- Break their jobs down into manageable chunks to identify what to teach
- Create a measurable plan for transferring skills

[1] This case has been disguised.

- Teach job content more effectively by considering apprentices' learning styles
- Ask questions to ensure the content was actually learned

Unfortunately, soon after the workshop CIT's division went through a major reorganization, which temporarily took the focus off efforts to accelerate knowledge transfer. But, as things settled down mid-year, Millar recalled:

> I remained committed to getting mentoring more formally established in the team because I saw it as the best way to build future capabilities and improve performance. I wanted to keep our new employees and reduce the turnover we had in the past among young staff members. I thought mentoring would get them engaged and up to speed faster. Also, I was afraid a couple of our senior staff could leave tomorrow, taking irreplaceable knowledge with them.

To jump start the mentoring process, Millar engaged Steve Trautman, developer of the Peer Mentoring workshop, as a consultant to clarify the best way to get the team fully engaged with more effective knowledge transfer practices. Working with Trautman, the CIT leader developed a four-phase pilot:

- Phase 1 included developing a business case for investing in improved knowledge transfer capabilities by training employees in mentoring skills using the Peer Mentoring Workshop.
- Phase 2 would involve a series of action learning projects where team members applied their new mentoring capabilities to cross train each other and ramp up the new employees.
- Phase 3, in the future, would include revisiting the unit's strategic objectives to identify the risks of specific knowledge gaps and potential capability losses. Then, redundant capabilities could be developed to support future business needs allowing Millar to focus the team's future mentoring activities on high priority areas.
- Phase 4 would include sharing the results of the pilot with other directorates at Boulder since each one faced similar challenges.

Phase 2 of the CIT pilot consisted of three projects. In one Peter Tillman, a senior chemist, worked with three junior people to teach them the basics of toxic substance testing. This included learning how to write a test plan, set up the lab, run the tests in a variety of formats, and then analyze the resulting data. Mentoring efforts like this can reveal unexpected – and critical – knowledge gaps. For example, Tillman discovered that his young engineers had not had sufficient statistics courses in college, so he had to step back and teach them statistics, practicing with data from old toxic substance tests.

By August 2007, Tillman had gone through the elements of the TST Lab training plan with his three protégés. As a result, Millar's team was able to bring the lab back on line in time to apply for several strategic outside projects. And of course, CIT could also now use the TST Lab in house. This would help keep development programs on track and save on costly external testing.

Another project in the mentoring pilot involved onboarding Karl Everett, a young engineer who had recently joined CIT. Using the tools from the pilot, Everett worked with his primary mentor, Victor Zuckert, on managing a $1 million research contract. In the process, Everett learned how to work through a procurement project and how to manage contractual research. This was important because, due to resource constraints, senior staffers were being asked to manage contracts when their expertise could have been better used elsewhere. Now a junior staffer could free up the veterans for more difficult research tasks and, as a bonus, this research project was an exciting opportunity for such a young engineer.

A third project in the CIT mentoring pilot was designed to transfer unique knowledge from a

veteran chemist to a mid-career staff member who was looking for new challenges. One team member who had been scheduled to work on an toxic waste simulation project left unexpectedly for another assignment. This left octogenarian Oscar Talbot as the only chemist with the expertise to carry out this work. Millar not only wanted the revenue from the project, but she also wanted to transfer Talbot's knowledge before he left Boulder. "Oscar is our last line of defense in materials characterization," said Millar, "because the other person working with him retired last year." Raul Vasquez, who had been managing technical contracts, was looking for a new challenge to apply his graduate work in chemistry.

So Talbot and Vasquez began working together with the veteran transferring his knowledge so Vasquez could do the research. Millar saw two benefits in this partnership. It would reduce the impacts of losing Talbot's singular knowledge, and it was a way to re-energize and retain a mid-career employee who was looking for a way to advance his career.

As she assessed the CIT pilot, Millar had several observations:

> When you implement a mentoring program, you need to look at your strategic objectives because you've got to decide where to concentrate. Our major concern is we are going to lose our core capabilities unless we start building new ones in our younger staff. We have a lot of new employees coming on board, and our senior people have limited time to teach them. But with the mentoring program a protocol is being established for what has to be done to get a new person up to speed faster so they're productive.
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> Now I see a lot of informal mentoring going on in my team. More senior scientists will say, 'Sit down and I'll give you the background on that.' They have taken a more teaching-oriented or knowledge sharing approach in working with younger team members. And young staffers have gotten pretty savvy about going out and getting people to teach them. After the last reorganization, I was overwhelmed with work, but I was also committed to getting mentoring more formally established because I saw it as the best way to move my team forward. And it's worked.

Epilogue: The results from the CIT pilot were sufficiently compelling to launch an equivalent program in another division at Boulder. In September 2007, the Biotechnology Division started work on their own knowledge transfer program.

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